

FUNCTION : qsOEIS[getOEISseq] - get OEIS sequence

CALLING SEQUENCE : getOEISseq(OEISnum)  
getOEISseq(OEISnum,option)

PARAMETERS : OEISnum - OEIS sequence number

OPTIONS: Option is usually one of the following  
["number", "name", "time", "example", "keyword", "formula",  
"author", "revision", "comment", "xref", "created", "data",  
"references", "offset"]

GLOBAL VARIABLES : NONE

SYNOPSIS : getOEISseq with a single arg sends a sequence number query to OEIS  
prints a message with possible additional arguments  
or a warning that the sequences does not exist.

EXAMPLES :

```
> with(qsOEIS):  
> getOEISseq(53251);
```

Repeat this function with ONE of the following  
additional arguments

```
["comment", "revision", "reference", "formula", "ext", "link", "offset", "xref",  
"mathematica", "number", "created", "time", "data", "author", "example",  
"name", "references", "program", "maple", "keyword"]
```

```
> getOEISseq(53251,name);
```

```
"Coefficients of the '3rd order' mock theta function psi(q)"
```

```
> getOEISseq(53251,data);
```

```
"0,1,1,1,2,2,2,3,3,4,5,5,6,7,8,9,11,12,13,16,17,19,22,24,27,31,34,37,42,46,5\  
1,57,62,68,76,83,91,101,109,120,132,143,156,171,186,202,221,239,259,283,\  
306,331,360,388,420,455,490,529,572,616,663,716,769,827"
```

```
> parse(%);
```

```
0, 1, 1, 1, 2, 2, 2, 3, 3, 4, 5, 5, 6, 7, 8, 9, 11, 12, 13, 16, 17, 19, 22, 24,  
27, 31, 34, 37, 42, 46, 51, 57, 62, 68, 76, 83, 91, 101, 109, 120, 132, 143,  
156, 171, 186, 202, 221, 239, 259, 283, 306, 331, 360, 388, 420, 455, 490,  
529, 572, 616, 663, 716, 769, 827
```

```
> getOEISseq(53251,author);
```

```
"_Dean Hickerson_, Dec 19 1999"
```

DISCUSSION :

We see that OEIS sequence 53251 correspond to coefficients of the  
third order mock theta function  $\psi(q)$ . The author was  
Dean Hickerson.

SEE ALSO :

grabOEIS, matchOEIS

FUNCTION : qsOEIS[grabOEISseq] - send sequence query to OEIS

CALLING SEQUENCE : getOEISseq(seq)

PARAMETERS : seq - list of positive integers

GLOBAL VARIABLES : NONE

SYNOPSIS : grabOEIS sends a sequence query to OEIS which returns data  
in JSON format.

EXAMPLES :

```
> with(qsOEIS):
> L := [1, 1, 1, 2, 2, 2, 3, 3, 4, 5, 5, 6, 7, 8, 9, 11, 12, 13, 16, 17]:
> Y1:=grabOEIS(L):
> whattype(Y1);
                                string

> Y2:=eval(JSON:-ParseString(Y1)):
> whattype(Y2);
                                table

> indices(Y2);
      ["count"], ["results"], ["start"], ["greeting"], ["query"]

> Y2["count"];
                                1

> Y2["results"][1]["name"];
      "Coefficients of the '3rd order' mock theta function psi(q)"

> quit
```

DISCUSSION :

SEE ALSO :

FUNCTION : qsOEIS[matchOEIS] - find matching sequence in OEIS

CALLING SEQUENCE : matchOEIS(f)  
 matchOEIS(f, j2)  
 matchOEIS(f, j1, j2)  
 matchOEIS(f, j1, j2, num1)

PARAMETERS : f - qseries or list  
 j1, j2 - positive integers  $j1 < j2$   
 num1 - positive integer

GLOBAL VARIABLES : NONE

SYNOPSIS : getOEISseq returns matching sequences in OEIS.  
 If f is qseries then a list of integer coefficients is produced,  
 otherwise f is list of integers. This list of integers is  
 sent to OEIS for a match. The number of matches is printed  
 and list of matching OEIS sequence numbers (at most 10) returned.  
 The list L has the form  $L = [c(j), j=j1 .. j2]$ .  
 If f is qseries  $j1=qseries[lqdegree](f)$  and  
 $j=qseries[qdegree](f)$ . The function returns a JSON string.

EXAMPLES :

```
> with(qseries):
> with(qsOEIS):
> F1:=series(add(q^(n^2)/aqprod(q,q^2,n),n=1..10),q,101):
> matchOEIS(F1,10):
```

There were 37 matches (returning the first 10)

```
87897, "Number of partitions of n into odd parts greater than 1."
53251, "Coefficients of the '3rd order' mock theta function psi(q)"
136758, "a(n) = leading digit of n! in base 7."
120170, "a(n) = ceiling( Sum_{i=1..n-1} a(i)/5 ), a(1)=1."
97409, "Initial decimal digit of n^5."
54911, "Number of n-dimensional odd unimodular lattice (or quadratic forms)."
97412, "Initial decimal digit of n^8."
90184,
"Number of partitions of the n-th 3-smooth number into sums of 2s and 3s."
181631,
"Triangle by rows, number of leading 1's in Fibonacci Maximal notation."
210469, "a(n) = n - primepi(2n)."
```

```
> matchOEIS(F1,20):
```

There were 1 matches (returning the first 1)

```
53251, "Coefficients of the '3rd order' mock theta function psi(q)"
```

DISCUSSION :

The first 10 coefficients of F1 matched 37 sequences in OEIS, with the first 10 being printed. The first 20 coefficients had one match with OEIS sequence 53251, which corresponds to the third order mock theta function psi(q).

SEE ALSO :

getOEISseq, grabOEIS

FUNCTION : qsOEIS[qs2L] - List of coefficients of q-series

CALLING SEQUENCE : qs2L(f,T1,T2)

PARAMETERS : f - qseries  
T1,T2 - positive integers  $T1 < T2$

GLOBAL VARIABLES : NONE

SYNOPSIS : qs2l(f,T1,T2) returns the list  
[seq(coeff(f,q,j),j=T1 .. T2)]

EXAMPLES :

```
> with(qsOEIS):
> with(qseries):
> f3:=series(add(q^(n^2)/qprod(-q,q,n)^2,n=0..10),q,101):
> L:=qs2L(f3,1,20);
L := [1, -2, 3, -3, 3, -5, 7, -6, 6, -10, 12, -11, 13, -17, 20, -21, 21, -27,
      34, -33]

> matchOEIS(L);
There were 2 matches (returning the first 2)
      25, "Coefficients of the 3rd order mock theta function f(q)."
```

260460, "Expansion of f(-q) in powers of q where f() is a 3rd order mock theta function."

DISCUSSION :

SEE ALSO :  
matchOEIS

FUNCTION : qsOEIS[qsOEISchanges] - print out list of recent changes to  
qsOEIS package

CALLING SEQUENCE : qsOEISchanges()

PARAMETERS : none

GLOBAL VARIABLES : none

SYNOPSIS :

qsOEISchanges() prints out a list of changes in previous versions  
of the qsOEIS package.

EXAMPLES :

```
> with(qsOEIS):
> qsOEISchanges();
*****
*
*
* qsOEIS package version 0.1 - Sun, Aug 2, 2020 1:50:55 PM
* qsOEIS package version 0.2 - Fri, Jan 22, 2021 7:06:27 PM
* This version tested on MAPLE 2020
*
*
* Changes since version 0.1 - Aug 2, 2020
*
* * New function:
*   qs2L
*
* Please report any problems to fgarvan@ufl.edu
* NO Previous versions:
*****
```

SEE ALSO :

qsOEISpversion

FUNCTION : qsOEIS[qsOEISpversion] - package version

CALLING SEQUENCE : qsOEISpversion()

PARAMETERS : none

SYNOPSIS :

Prints version and date of qsOEIS package

EXAMPLE :

```
> with(qsOEIS):
> qsOEISpversion();
*****
*
*CURRENT VERSION:
* qsOEIS package version 0.2
* Fri, Jan 22, 2021 7:06:27 PM
* This version tested on MAPLE 2020
*
*PREVIOUS VERSIONS:
* qsOEIS package version 0.1
* Sun, Aug 2, 2020 1:50:55 PM
* This version tested on MAPLE 2020
*
* Please report any problems to fgarvan@ufl.edu
* NO Previous versions:

*****
> quit
memory used=1.4MB, alloc=8.3MB, time=0.11
```

SEE ALSO :

qsOEISchanges

FUNCTION : qsOEIS[seqlist2string] - convert sequence list of integers to a string

CALLING SEQUENCE : seqlist2string(seq):

PARAMETERS : seq - list of integers

GLOBAL VARIABLES : NONE

SYNOPSIS :

Converts a list containing a sequences of itegers to string which can be use by the URL[Get] function. This is used by the grabOEIS function.

EXAMPLES :

```
> with(qsOEIS):
> L := [1, 1, 1, 2, 2, 2, 3, 3, 4, 5, 5, 6, 7, 8, 9, 11, 12, 13, 16, 17];
      L := [1, 1, 1, 2, 2, 2, 3, 3, 4, 5, 5, 6, 7, 8, 9, 11, 12, 13, 16, 17]
> seqlist2string(L);
      "1,1,1,2,2,2,3,3,4,5,5,6,7,8,9,11,12,13,16,17,"
```

DISCUSSION :

SEE ALSO :  
grabOEIS

